

Habitat Restoration following Invasive Species Management

A quick (and dirty) primer and planning considerations

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What is Ecological Restoration??

A few quick definitions...

Revegetation - Process of replanting and rebuilding the soil of disturbed land

Reclamation - Process where very degraded lands are returned to productivity (suitable for use for habitation, cultivation, or other uses)

Restoration- Process of returning an ecosystem to a close approximation* of a pre-existing condition (usually prior to an identifiable disturbance or stress).

Usually includes reestablishing: structure, function and integrity

Typically accomplished by:

- Returning processes & functions (hydrology, topography)
- Improving soil conditions (if altered), and
- Planting or reintroduction of native plants (and/or animals)

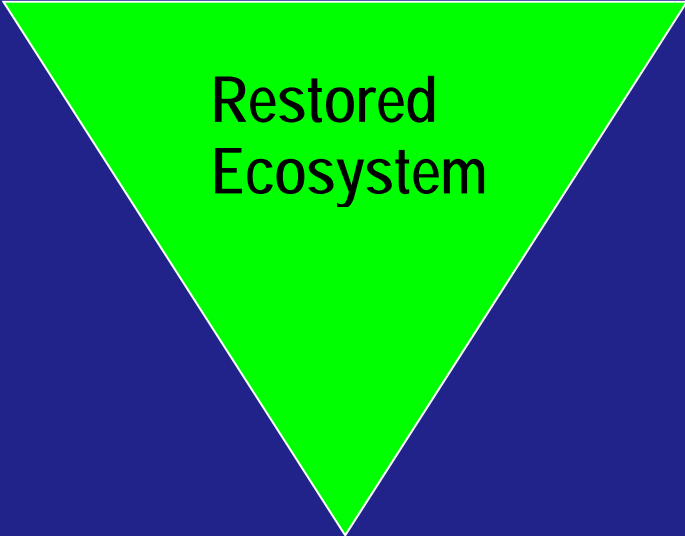
*Note: this is not necessarily returning to a “pristine” condition

Ecological Restoration

In the invasive species context...

**Invaders effectively
managed**

**Restoration occurs
(Actively or Passively)**



**Restored
Ecosystem**

**Processes (e.g. fire,
flooding) are returned to a
natural range of variation**

Key Questions That Must be Addressed *prior to any actual management activities...*

1. What are you managing for?
2. What are your current and future threats (what are the causes of degradation)?
3. What tools and resources do you have available?
4. How will you define success, and can it be measured?

 ***Is it all just overwhelming??***

Develop a Management PLAN!!

Using an Adaptive Management Approach



So many invasives...
So little staff and \$!



Need to avoid wasting time,

\$\$\$

and other resources on projects that
do not directly improve or are
real threats to your
MANAGEMENT GOALS

1. Goals and Objectives

- What are you trying to achieve?
- How will you define success?



Biological Diversity



Training Exercises



Endangered Species



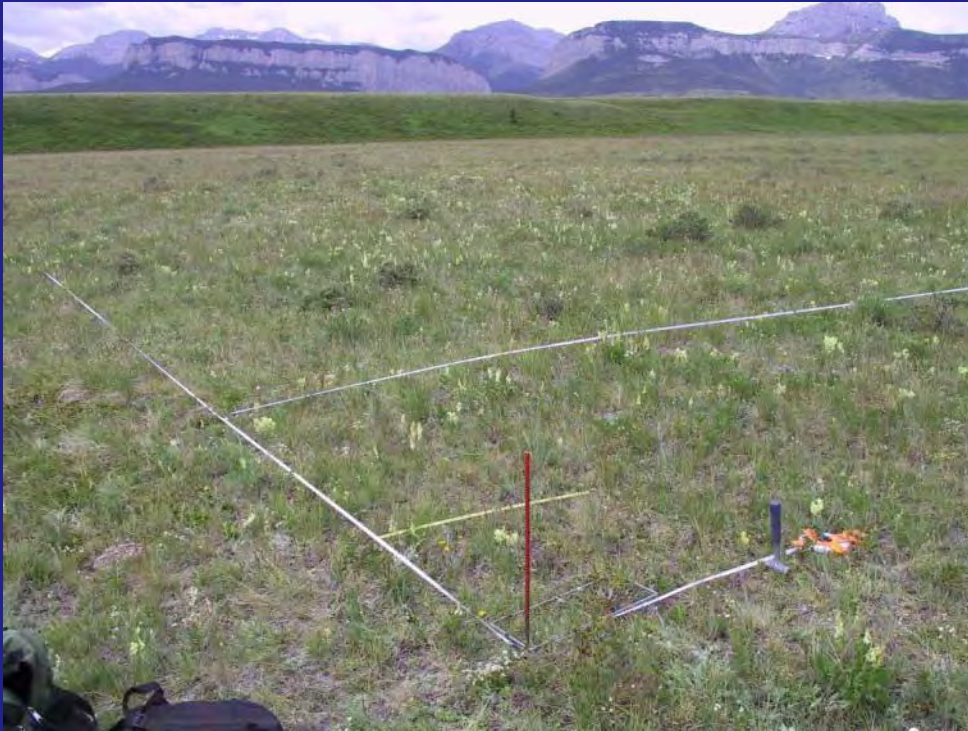
Recreation



Education

What is Your Goal?

A healthy, diverse functioning plant community...



This may mean a community with *NO* weeds....or...

...it may mean a community that has some weeds, as long as the weeds do not significantly impact what you are managing for.

Be as specific as you can, in defining your goals & objectives!

2. Assessing the situation

Assess the site

- What is the biological & environmental context?
- How is the site altered?
- What was there historically?
- How are soil conditions? Water resources?
- Are there extant plant materials?



Assess the project

- What are the cause(s) of degradation? At what scale(s)?
- What are the threats and opportunities?
- Can you make your project more resistant to further invasions, adaptable to predicted climate changes, etc.?
- Which are your areas of highest priority?

Assess available resources and limitations

- What resources (funds, staff, tools, etc.) are available, and are there constraints?
- What is your long-term management outlook/capacity?
- Are there regulatory hurdles?

****Is restoration necessary, and is it feasible?**

****What is the potential for successful restoration?**

3. Planning Strategy Considerations...



- Scale & scope of the project
- How to get to your desired future condition(s)?
- What partners/stakeholders need to be involved?
- Is there institutional support?
- Are areas mapped?
- What were the historical conditions at the site?
- Is it appropriate to try to mimic this?
- How can you plan for predicted climate changes?
- What tools & techniques are available and appropriate?
- Which species are appropriate for the site?
- Are native plant materials genetically-appropriate?
- Are there extant plant materials at the site?
- Assess costs for short- and long-term management
- How to best prevent future invasive species?
- Regulatory hurdles?

1. What are you trying to restore?
2. How best to get from here to there?
3. Are biological/ecological considerations different at different scales?
4. Can your project leverage further work at larger scales?

4. Project Implementation



- Set timetables
- Determine responsibilities
- Select contractors
- Obtain permits & materials
- Look for opportunities to control invasives during implementation
- Reduce unnecessary spread of invasives. Think about where your equipment has been and where your dirt is going.
- Consider long term management. Will there be any?

5. Monitoring

Needed to:

- Assess condition
- Assess change(s) in condition
- Determine if your restoration project is a success.



Be sure to...

- Develop very specific (measurable) objectives for your project
- Avoid designing your monitoring without having specific objectives in mind

6. Reassessment



- Are you achieving your stated goals & objectives?
- Are you making adequate step-wise progression towards reaching your objectives?
- If not, re-adjust your plan!

Overcoming Obstacles to Restoration & Effective Invasive Species Management

- Develop a *MANAGEMENT PLAN* to make ideas manageable!
 - Make your desired future state your goal!
 - Stepwise progression (objectives) towards goals
 - Monitoring plan, that adequately captures changes in condition due to management actions
 - Consider long-term management. Will there be any?
- Develop research projects that aid on-the-ground management.

A few examples...

Example 1 – Cox Island, Oregon



Take-home messages:

- Complete local eradication is possible, given enough resources to do the control and follow-up monitoring.
- Passive restoration is possible if there are extant materials in the soil seed bank, and the site is otherwise intact.

Example 2 – Hawaii Volcanoes National Park



Dry forest invaded
by fire-promoting
grasses



Myoporum sandwicense



Sesbania tomentosa

Take-home messages:

- Successful restoration does not always need to return to a “prior” state
- It is of utmost importance to state your overall restoration goals & objectives

Example 3 – Eastern Shore, Virginia



Take-home messages:

- Is local control of a widespread invader a worthwhile goal?
- What you decide to actively plant (and manage for), can lead to local climate resistance and adaptation.

Two Case Studies from DoD Installations
Short Discussion & Peer Feedback!!